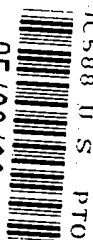


05/29/98



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+**UTILITY  
PATENT APPLICATION  
TRANSMITTAL**

(Only for new nonprovisional applications under 37 CFR 1.53(b))

Attorney Docket No. 555255012073 Total Pages 53

First Named Inventor or Application Identifier

Gary Mousseau et al.

Express Mail Label No. EL059794861US

**APPLICATION ELEMENTS**

See MPEP chapter 600 concerning utility patent application contents.

ADDRESS TO: Assistant Commissioner for Patents  
Box Patent Application  
Washington, DC 202311. ☒ Fee Transmittal Form  
(Submit an original, and a duplicate for fee processing)2. ☒ Specification [Total Pages 35]  
(preferred arrangement set forth below)

- Descriptive title of the invention
- Cross References to Related Applications
- Statement Regarding Fed sponsored R & D
- Reference to Microfiche Appendix
- Background of the invention
- Brief Summary of the invention
- Brief Description of the Drawings (if filed)
- Detailed Description
- Claim(s)
- Abstract of the Disclosure

3. ☒ Drawing(s) (35 USC 113) [Total Sheets 5]

4. Oath or Declaration [Total Pages 2]

- a. ☒ Newly executed (original or copy)
- b. ☐ Copy from a prior application (37 CFR 1.63(d))  
(for continuation/divisional with Box 17 completed)  
(Note Box 5 below)

i. ☐ **DELETION OF INVENTOR(S)**  
Signed statement attached deleting  
inventor(s) named in the prior application,  
see 37 CFR 1.63(d)(2) and 1.33(b).

5. ☐ Incorporation By Reference (useable if Box 4b is checked)  
The entire disclosure of the prior application, from which a  
copy of the oath or declaration is supplied under Box 4b,  
is considered as being part of the disclosure of the  
accompanying application and is hereby incorporated by  
reference therein.

6. ☐ Microfiche Computer Program (Appendix)7. Nucleotide and/or Amino Acid Sequence Submission  
(if applicable, all necessary)

- a. ☐ Computer Readable Copy
- b. ☐ Paper Copy (identical to computer copy)
- c. ☐ Statement verifying identity of above copies

**ACCOMPANYING APPLICATION PARTS**8. ☒ Assignment Papers (cover sheet & document(s))  
(4 pages)9. ☐ 37 CFR 3.73(b) Statement ☐ Power of Attorney  
(when there is an assignee)10. ☐ English Translation Document (if applicable)11. ☐ Information Disclosure ☐ Copies of IDS  
Statement (IDS)/PTO-1449 Citations12. ☐ Preliminary Amendment13. ☒ Return Receipt Postcard (MPEP 503)  
(Should be specifically itemized)14. ☒ Small Entity ☐ Statement filed in prior application,  
Statement(s) Status still proper and desired  
(2 pages)15. ☐ Certified Copy of Priority Document(s)  
(if foreign priority is claimed)16. ☒ Other: Check.....

17. If a CONTINUING APPLICATION, check appropriate box and supply the requisite information:

☐ Continuation ☐ Divisional ☐ Continuation-in-part (CIP) of prior application No: \_\_\_\_\_/\_\_\_\_\_**18. CORRESPONDENCE ADDRESS**☐ Customer Number or Bar Code Label

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<h2 style="margin: 0;">FEE TRANSMITTAL</h2> <p style="font-size: small; margin: 5px 0;">Note: Effective October 1, 1997. Patent fees are subject to annual revision.</p>	<p><b>Complete If Known</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>Application Number</td><td></td></tr> <tr><td>Filing Date</td><td></td></tr> <tr><td>First Named Inventor</td><td>Mousseau et al.</td></tr> <tr><td>Group Art Unit</td><td></td></tr> <tr><td>Examiner Name</td><td></td></tr> <tr><td>Attorney Docket Number</td><td>555255012073</td></tr> </table>	Application Number		Filing Date		First Named Inventor	Mousseau et al.	Group Art Unit		Examiner Name		Attorney Docket Number	555255012073
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METHOD OF PAYMENT (check one)	FEE CALCULATION (continued)																																																																																																																								
<p>1. <input checked="" type="checkbox"/> The Commissioner is hereby authorized to charge indicated fees and credit any over payments to</p> <p>Deposit Account Number: 10-1202</p> <p>Deposit Account Name:</p> <p><input checked="" type="checkbox"/> Charge Any Additional Fee Required Under 37 CFR 1.16 and 1.17    <input type="checkbox"/> Charge the Issue Fee Set In 37 CFR 1.18 at the Mailing of the Notice of Allowance</p> <p>2. <input checked="" type="checkbox"/> Payment Enclosed:  <input checked="" type="checkbox"/> Check    <input type="checkbox"/> Money Order    <input type="checkbox"/> Other</p>	<p><b>3. ADDITIONAL FEES</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Large Entity Fee Code (\$)</th> <th>Small Entity Fee Code (\$)</th> <th>Fee Description</th> <th>Fee Paid</th> </tr> </thead> <tbody> <tr><td>105 130</td><td>205 65</td><td>Surcharge - late filing fee or oath</td><td></td></tr> <tr><td>127 50</td><td>227 25</td><td>Surcharge - late provisional filing fee or cover sheet.</td><td></td></tr> <tr><td>139 130</td><td>139 130</td><td>Non-English specification</td><td></td></tr> <tr><td>147 2,520</td><td>147 2,520</td><td>For filing a request for reexamination</td><td></td></tr> <tr><td>112 920*</td><td>112 920*</td><td>Requesting publication of SIR prior to Examiner action</td><td></td></tr> <tr><td>113 1,840*</td><td>113 1,840*</td><td>Requesting publication of SIR after Examiner action</td><td></td></tr> <tr><td>115 110</td><td>215 55</td><td>Extension for reply within first month</td><td></td></tr> <tr><td>116 400</td><td>216 200</td><td>Extension for reply within second month</td><td></td></tr> <tr><td>117 950</td><td>217 475</td><td>Extension for reply within third month</td><td></td></tr> <tr><td>118 1,510</td><td>218 755</td><td>Extension for reply within fourth month</td><td></td></tr> <tr><td>128 2,060</td><td>228 1,030</td><td>Extension for reply within fifth month</td><td></td></tr> <tr><td>119 310</td><td>219 155</td><td>Notice of Appeal</td><td></td></tr> <tr><td>120 310</td><td>220 155</td><td>Filing a brief in support of an appeal</td><td></td></tr> <tr><td>121 270</td><td>221 135</td><td>Request for oral hearing</td><td></td></tr> <tr><td>138 1,510</td><td>138 1,510</td><td>Petition to institute a public use proceeding</td><td></td></tr> <tr><td>140 110</td><td>240 55</td><td>Petition to revive - unavoidable</td><td></td></tr> <tr><td>141 1,320</td><td>241 660</td><td>Petition to revive - unintentional</td><td></td></tr> <tr><td>142 1,320</td><td>242 660</td><td>Utility issue fee (or reissue)</td><td></td></tr> <tr><td>143 450</td><td>243 225</td><td>Design issue fee</td><td></td></tr> <tr><td>144 670</td><td>244 335</td><td>Plant issue fee</td><td></td></tr> <tr><td>122 130</td><td>122 130</td><td>Petitions to the Commissioner</td><td></td></tr> <tr><td>123 50</td><td>123 50</td><td>Petitions related to provisional applications</td><td></td></tr> <tr><td>126 240</td><td>126 240</td><td>Submission of Information Disclosure Stmt</td><td></td></tr> <tr><td>581 40</td><td>581 40</td><td>Recording each patent assignment per property (times number of properties)</td><td>40</td></tr> <tr><td>146 790</td><td>246 395</td><td>Filing a submission after final rejection (37 CFR 1.129(a))</td><td></td></tr> <tr><td>149 790</td><td>249 395</td><td>For each additional invention to be examined (37 CFR 1.129(b))</td><td></td></tr> <tr><td colspan="3">Other fee (specify) _____</td><td></td></tr> <tr><td colspan="3">Other fee (specify) _____</td><td></td></tr> <tr> <td colspan="2" style="text-align: right;"><b>SUBTOTAL (3)</b></td> <td colspan="2">(\$) 40.00</td> </tr> </tbody> </table>	Large Entity Fee Code (\$)	Small Entity Fee Code (\$)	Fee Description	Fee Paid	105 130	205 65	Surcharge - late filing fee or oath		127 50	227 25	Surcharge - late provisional filing fee or cover sheet.		139 130	139 130	Non-English specification		147 2,520	147 2,520	For filing a request for reexamination		112 920*	112 920*	Requesting publication of SIR prior to Examiner action		113 1,840*	113 1,840*	Requesting publication of SIR after Examiner action		115 110	215 55	Extension for reply within first month		116 400	216 200	Extension for reply within second month		117 950	217 475	Extension for reply within third month		118 1,510	218 755	Extension for reply within fourth month		128 2,060	228 1,030	Extension for reply within fifth month		119 310	219 155	Notice of Appeal		120 310	220 155	Filing a brief in support of an appeal		121 270	221 135	Request for oral hearing		138 1,510	138 1,510	Petition to institute a public use proceeding		140 110	240 55	Petition to revive - unavoidable		141 1,320	241 660	Petition to revive - unintentional		142 1,320	242 660	Utility issue fee (or reissue)		143 450	243 225	Design issue fee		144 670	244 335	Plant issue fee		122 130	122 130	Petitions to the Commissioner		123 50	123 50	Petitions related to provisional applications		126 240	126 240	Submission of Information Disclosure Stmt		581 40	581 40	Recording each patent assignment per property (times number of properties)	40	146 790	246 395	Filing a submission after final rejection (37 CFR 1.129(a))		149 790	249 395	For each additional invention to be examined (37 CFR 1.129(b))		Other fee (specify) _____				Other fee (specify) _____				<b>SUBTOTAL (3)</b>		(\$) 40.00	
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SUBMITTED BY			Complete (if applicable)	
Typed or Printed Name	David B. Cochran, Esq.		Reg. Number	39,142
Signature	David B. Cochran	Date	5/29/98	
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**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Title of the Invention

**System and Method for Pushing Information from a Host System to a Mobile  
Data Communication Device**

Inventors

Gary Mousseau  
Mihal Lazaridis

# **System and Method for Pushing Information from a Host System to a Mobile Data Communication Device**

## **BACKGROUND OF THE INVENTION**

5           The present invention is directed toward the field of replicating information from a host system where the information is normally stored to a mobile data communication device. In particular, the system and method of the present invention provide an event-driven redirection computer program ("redirector program") operating at the host system, which, upon sensing a particular user-defined event has occurred, redirects user-selected data items from the host system  
10           to the user's mobile data communication device. The mobile data communication device is preferably coupled to the host system via a wireless network and one or more landline networks. Due to the bandwidth limitations of wireless networks, only a portion of a user-selected data item is generally redirected to the user's mobile device, with the user given the option of then retrieving the entire data item (or some other portion of the data item) from the host system.

15           Instead of warehousing (or storing) the user's data items at the host system and then "synchronizing" the mobile data communication device to data items stored at the host system when the mobile device requests that such items of information be communicated to it, the present invention employs a "push" paradigm that continuously packages and retransmits the user-selected items of information to the mobile data communication device in response to a triggering event detected at  
20           the host system. Wireless mobile data communications devices, especially those that can return a confirmation signal to the host that the pushed data has been received are especially well suited for this type of push paradigm.

          Present systems and methods for replicating information from a host system to a user's mobile data communication device are typically "synchronization" systems in which the user's data items are

warehoused (or stored) at the host system for an indefinite period of time and then transmitted in bulk only in response to a user request. In these types of systems and methods, when replication of the warehoused data items to the mobile device is desired, the user typically places the mobile device in an interface cradle that is electrically connected to the host system via some form of local, dedicated communication, such as a serial cable or an infrared or other type of wireless link. Software executing on the mobile data communication device then transmits commands via the local communications link to the host system to cause the host to begin transmitting the user's data items for storage in a memory bank of the mobile device. In these synchronization schemes, the mobile unit "pulls" the warehoused information from the host system in a batch each time the user desires to replicate information between the two devices. Therefore, the two systems (host and mobile) only maintain the same data items after a user-initiated command sequence that causes the mobile device to download the data items from the host system. A general problem with these synchronization systems is that the only time that the user data items are replicated between the host system and the mobile data communication device is when the user commands the mobile device to download or pull the user data from the host system. Five minutes later a new message could be sent to the user, but the user would not receive that message until the next time the user fetches the user data items. Thus, a user may fail to respond to an emergency update or message because the user only periodically synchronizes the system, such as once per day. Other problems with these systems include: (1) the amount of data to be reconciled between the host and the mobile device can become large if the user does not "synchronize" on a daily or hourly basis, leading to bandwidth difficulties, particularly when the mobile device is communicating via a wireless packet-switched network; and (2) reconciling large amounts of data, as can accrue in these batch-mode synchronization systems, can require a great deal of communication between the host and the mobile device, thus leading to a more complex, costly

and energy-inefficient system. A more automated, continuous, efficient and reliable system of ensuring that user data items are replicated at the user's mobile device is therefore needed.

An additional feature of the present invention is that the push paradigm, in combination with a return communications pathway, lends itself well to a system that permits a user to control remotely, through the user's mobile device, a number of aspects of the host system.

There remains a general need in this art for a system and method of continuously pushing user-selected data items (or certain portions of the selected data items) stored at a host system to a user's mobile data communication device.

There remains a more particular need for such a system and method where user-selected data items are continuously "pushed" from the host system to the mobile data communication device upon the occurrence of one or more user-defined triggering events.

There remains an additional need for such a system and method that provides flexibility in the types and quantities of user data items that are pushed from the host system to the mobile data communication device and that also provides flexibility in the configuration and types of events that can serve to trigger the redirection of the user data items.

There remains yet an additional need for such a system and method that can operate locally on a user's desktop PC or at a distance via a network server.

There remains still another need for such a system and method that provides for secure, transparent delivery of the user-selected data items from the host system to the mobile device.

## SUMMARY OF THE INVENTION

The present invention overcomes the problems noted above and satisfies the needs in this field for a system and method of pushing user-selected data items from a host system to a user's mobile

data communication device upon detecting the occurrence of one or more user-defined event triggers.

As used in this application, the term host system refers to the computer where the redirector software is operating. In the preferred embodiment of the present invention, the host system is a user's desktop PC, although, alternatively, the host system could be a network server connected to the user's PC via a local-area network ("LAN"), or could be any other system that is in communication with the user's desktop PC.

A redirector program operating at the host system enables the user to redirect or mirror certain user-selected data items (or parts of data items) from the host system to the user's mobile data communication device upon detecting that one or more user-defined triggering events has occurred. Also operating at the host system are various sub-systems that can be configured to create triggering events, such as a screen saver sub-system or a keyboard sub-system, as well as sub-systems for repackaging the user's data items for transparent delivery to the mobile data device, such as a TCP/IP sub-system or one or more E-Mail sub-systems. Other sub-systems for creating triggering events and repackaging the user's data items could also be present at the host system. The host system also includes a primary memory store where the user's data items are normally stored.

Using the redirector program, the user can select certain data items for redirection, such as E-mail messages, calendar events, meeting notifications, address entries, journal entries, personal reminders etc. Having selected the data items for redirection, the user can then configure one or more event triggers to be sensed by the redirector program to initiate redirection of the user data items. These user-defined trigger points (or event triggers) include external events, internal events and networked events. Examples of external events include: receiving a message from the user's mobile data communication device to begin redirection; receiving a similar message from some external computer, sensing that the user is no longer in the vicinity of the host system; or any other

event that is external to the host system. Internal events could be a calendar alarm, screen saver activation, keyboard timeout, programmable timer, or any other user-defined event that is internal to the host system. Networked events are user-defined messages that are transmitted to the host system from another computer coupled to the host system via a network to initiate redirection. These are just some of the examples of the types of user-defined events that can trigger the redirector program to push data items from the host to the mobile device. Although in the preferred embodiment it is anticipated that the configuration that specifies which data items will be redirected and in what form will be set at the host system, it is within the scope of this invention that such configuration may be set or modified through data sent from the mobile communications device.

In addition to the functionality noted above, the redirector program provides a set of software-implemented control functions for determining the type of mobile data communication device and its address, for programming a preferred list of message types that are to be redirected, and for determining whether the mobile device can receive and process certain types of message attachments, such as word processor or voice attachments. The determination of whether a particular mobile device can receive and process attachments is initially configured by the user of that mobile device at the host system. This configuration can be altered on a global or per message basis by transmitting a command message from the mobile device to the host system. If the redirector is configured so that the mobile data device cannot receive and process word processor or voice attachments, then the redirector routes these attachments to an external machine that is compatible with the particular attachment, such as an attached printer or networked fax machine or telephone. Other types of attachments could be redirected to other types of external machines in a similar fashion, depending upon the capabilities of the mobile device. For example, if a user is traveling and receives a message with an attachment that the user's mobile device can process or display, the user



may from a mobile communications device send a command message to the host system indicating that that attachment is to be sent to a fax machine at a hotel where the user will be spending the evening. This enables the user to receive important E-mail attachments as long as the host system is provided with sufficient information about the destination where the attachment is to be forwarded.

5           Once an event has triggered redirection of the user data items, the host system then repackages these items in a manner that is transparent to the mobile data communication device, so that information on the mobile device appears similar to information on the user's host system. The preferred repackaging method includes wrapping the user data items in an E-mail envelope that corresponds to the address of the mobile data communication device, although, alternatively, other  
10           repackaging methods could be used with the present invention, such as special-purpose TCP/IP wrapping techniques, or other methods of wrapping the user selected data items. The repackaging preferably results in E-mail messages generated by the user from the mobile device to be transmitted from the host system, thus enabling the user to appear to have a single E-mail address, such that the recipients of messages sent from the mobile communications device do not know where the user was  
15           physically located when the message was first sent. The repackaging also permits both messages to the mobile device and sent from the mobile device to be encrypted and decrypted as well as compressed and decompressed.

          In an alternative system and method, the redirector program executes on a network server, and the server is programmed to detect numerous redirection event triggers over the network from  
20           multiple user desktop computers coupled to the server via a LAN. The server can receive internal event triggers from each of the user desktops via the network, and can also receive external event triggers, such as messages from the users' mobile data communication devices. In response to receiving one of these triggers, the server redirects the user's data items to the proper mobile data

communication device. The user data items and addressing information for a particular mobile device can be stored at the server or at the user's PC. Using this alternative configuration, one redirector program can serve a plurality of users. This alternative configuration could also include an internet- or intranet-based redirector program that could be accessible through a secure webpage or other user interface. The redirector program could be located on an Internet Service Provider's system and accessible only through the Internet.

In another alternative configuration of the present invention, a redirector program operates at both the host system and at the user's mobile data communication device. In this configuration, the user's mobile device operates similarly to the host system described below, and is configured in a similar fashion to push certain user-selected data items from the mobile device to the user's host system (or some other computer) upon detecting an event trigger at the mobile device. This configuration provides two-way pushing of information from the host to the mobile device and from the mobile device to the host.

The primary advantage of the present invention is that it provides a system and method for triggering the continuous and real-time redirection of user-selected data items from a host system to a mobile data communication device. Other advantages of the present invention include: (1) flexibility in defining the types of user data to redirect, and in defining a preferred list of message types that are to be redirected or preferred senders whose messages are to be redirected; (2) flexibility in configuring the system to respond to numerous internal, external and networked triggering events; (3) transparent repackaging of the user data items in a variety of ways such that the mobile data communication device appears as though it were the host system; (4) integration with other host system components such as E-mail, TCP/IP, keyboard, screen saver, webpages and certain programs

that can either create user data items or be configured to provide trigger points; and (5) the ability to operate locally on a user's desktop system or at a distance via a network server.

These are just a few of the many advantages of the present invention, as described in more detail below. As will be appreciated, the invention is capable of other and different embodiments, and its several details are capable of modifications in various respects, all without departing from the spirit of the invention. Accordingly, the drawings and description of the preferred embodiments set forth below are to be regarded as illustrative in nature and not restrictive.

### BRIEF DESCRIPTION OF THE DRAWINGS

The present invention satisfies the needs noted above as will become apparent from the following description when read in conjunction with the accompanying drawings wherein:

FIG. 1 is a system diagram showing the redirection of user data items from a user's desktop PC (host system) to the user's mobile data communication device, where the redirector software is operating at the user's desktop PC.

FIG. 2 is a system diagram showing the redirection of user data items from a network server (host system) to the user's mobile data communication device, where the redirector software is operating at the server.

FIG. 3 is a block diagram showing the interaction of the redirector software with other components of the host system in FIG. 1 (the user's desktop PC) to enable the pushing of information from the host system to the user's mobile data communication device.

FIG. 4 is a flow chart showing the steps carried out by the redirector software operating at the host system.

FIG. 5 is a flow chart showing the steps carried out by the mobile data communication device to interface with the redirector software operating at the host system.

### DETAILED DESCRIPTION OF THE DRAWINGS

5 Referring now to the drawings, FIG. 1 is an example system diagram showing the redirection of user data items (such as message A or C) from a user's office PC (host system) 10 to the user's mobile data communication device 24, where the redirector software 12 is operating at the user's PC. Message A in FIG. 1 represents an internal message sent from desktop 26 to the user's host system 10 via LAN 14. Message C in FIG. 1 represents an external message from a sender that is not directly connected to LAN 14, such as the user's mobile data communication device 24, some other user's mobile device (not shown), or any user connected to the Internet 18. Message C also represents a command message from the user's mobile data communication device 24 to the host system 10. As described in more detail in FIG. 3, the host system 10 preferably includes, along with the typical hardware and software associated with a workstation or desktop computer, the redirector program 12, a TCP/IP subsystem 42, a primary message store 40, an E-mail subsystem 44, a screen saver subsystem 48, and a keyboard subsystem 46.

10 In FIG. 1, the host system 10 is the user's desktop system, typically located in the user's office. The host system 10 is connected to a LAN 14, which also connects to other computers 26, 28 that may be in the user's office or elsewhere. The LAN 14, in turn, is connected to a wide area network ("WAN") 18, preferably the Internet, which is defined by the use of the Transmission Control Protocol/Internet Protocol ("TCP/IP") to exchange information, but which, alternatively could be any other type of WAN. The connection of the LAN 14 to the WAN 18 is via high bandwidth link 16, typically a T1 or T3 connection. The WAN 18 in turn is connected to a variety

of gateways 20, via connections 32. A gateway forms a connection or bridge between the WAN 18 and some other type of network, such as an RF wireless network, cellular network, satellite network, or other synchronous or asynchronous land-line connection.

In the example of FIG. 1, a wireless gateway 20 is connected to the Internet for communicating via wireless link 22 to a plurality of wireless mobile data communication devices 24. Also shown in FIG. 1 is machine 30, which could be a FAX machine, a printer, a system for displaying images (such as video) or a machine capable of processing and playing audio files, such as a voice mail system. The present invention includes the ability to redirect certain message attachments to such an external machine 30 if the redirector program configuration data reflects that the mobile device 24 cannot receive and process the attachments, or if the user has specified that certain attachments are not to be forwarded to mobile device 24, even if such device can process those attachments. By way of example, consider an E-mail sent to a user that includes three attachments -- a word processing document, a video clip and an audio clip. The redirection program could be configured to send the text of the E-mail to the remote device, to send the word processing document to a networked printer located near the user, to send the video clip to a store accessible through a secure connection through the internet and to send the audio clip to the user's voice mail system. This example is not intended to limit the breadth and scope of the invention, but rather to illustrate the variety of possibilities embodied in the redirection concept.

The preferred mobile data communication device 24 is a hand-held two-way wireless paging computer, a wirelessly enabled palm-top computer, a mobile telephone with data messaging capabilities, or a wirelessly enabled laptop computer, but could, alternatively be other types of mobile data communication devices capable of sending and receiving messages via a network connection 22. Although it is preferable for the system to operate in a two-way communications mode, certain

aspects of the invention could be beneficially used in a "one and one-half" or acknowledgment paging environment, or even with a one-way paging system. The mobile data communication device 24 includes software program instructions that work in conjunction with the redirector program 12 to enable the seamless, transparent redirection of user-selected data items. FIG. 4 describes the basic method steps of the redirector program 12, and FIG. 5 describes the steps of the corresponding program operating at the mobile device 24.

In an alternative embodiment of the present invention, not explicitly shown in the drawings, the mobile device 24 also includes a redirector program. In this embodiment, user selected data items can be replicated from the host to the mobile device and vice versa. The configuration and operation of the mobile device 24 having a redirector program is similar to that described herein with respect to FIGs. 1-4.

A user of the present invention can configure the redirector program 12 to push certain user-selected data items to the user's mobile data communication device 24 when the redirector 12 detects that a particular user-defined event trigger (or trigger point) has taken place. User-selected data items preferably include E-mail messages, calendar events, meeting notifications, address entries, journal entries, personal alerts, alarms, warnings, stock quotes, news bulletins, etc., but could, alternatively, include any other type of message that is transmitted to the host system 10, or that the host system 10 acquires through the use of intelligent agents, such as data that is received after the host system 10 initiates a search of a database or a website or a bulletin board. In some instances, only a portion of the data item is transmitted to the mobile device 24 in order to minimize the amount of data transmitted via the wireless network 22. In these instances, the mobile device 24 can optionally send a command message to the host system to receive more or all of the data item if the user desires to receive it.

Among the user-defined event triggers that can be detected by the redirector program 12 are in the preferred embodiment external events, internal events and networked events. External events preferably include: (1) receiving a command message (such as message C) from the user's mobile data communication device to begin redirection, or to execute some other command at the host, such as a command to enable the preferred list mode, or to add or subtract a particular sender from the preferred list; (2) receiving a similar message from some external computer; and (3) sensing that the user is no longer in the vicinity of the host system; although, alternatively, an external event can be any other detectable occurrence that is external to the host system. Internal events could be a calendar alarm, screen saver activation, keyboard timeout, programmable timer, or any other user-defined event that is internal to the host system. Networked events are user-defined messages that are transmitted to the host system from another computer coupled to the host system via a network to initiate redirection. These are just some of the events that could be used with the present invention to initiate replication of the user-selected data items from the host system 10 to the mobile device 24.

FIG. 1 shows an E-mail message A being communicated over LAN 14 from computer 26 to the user's desktop system 10 (also shown in FIG. 1 is an external message C, which could be an E-mail message from an Internet user, or could be a command message from the user's mobile device 24). Once the message A (or C) reaches the primary message store of the host system 10, it can be detected and acted upon by the redirection software 12. The redirection software 12 can use many methods of detecting new messages. The preferred method of detecting new messages is using Microsoft's ® Messaging API (MAPI), in which programs, such as the redirector program 12, register for notifications or 'advise syncs' when changes to a mailbox take place. Other methods of detecting new messages could also be used with the present invention.

Assuming that the redirector program 12 is activated, and has been configured by the user (either through the sensing of an internal, network or external event) to replicate certain user data items (including messages of type A or C) to the mobile device 24, when the message A is received at the host system 10, the redirector program 12 detects its presence and prepares the message for redirection to the mobile device 24. In preparing the message for redirection, the redirector program 12 could compress the original message A, could compress the message header, or could encrypt the entire message A to create a secure link to the mobile device 24.

Also programmed into the redirector 12 is the address of the user's mobile data communication device 24, the type of device, and whether the device 24 can accept certain types of attachments, such as word processing or voice attachments. If the user's type of mobile device cannot accept these types of attachments, then the redirector 12 can be programmed to route the attachments to a fax or voice number where the user is located using an attached fax or voice machine 30.

The redirector may also be programmed with a preferred list mode that is configured by the user either at the host system 10, or remotely from the user's mobile data communication device by transmitting a command message C. The preferred list contains a list of senders (other users) whose messages are to be redirected or a list of message characteristics that determine whether a message is to be redirected. If activated, the preferred list mode causes the redirector program 12 to operate like a filter, only redirecting certain user data items based on whether the data item was sent from a sender on the preferred list or has certain message characteristics that if present will trigger or suppress redirection of the message. In the example of FIG. 1, if desktop system 26 was operated by a user on the preferred list of host system 10, and the preferred list option was activated, then message A would be redirected. If, however, desktop 26 was operated by a user not on the host



system's preferred list, then message A would not be redirected, even if the user of the host system had configured the redirector to push messages of type A. The user of the host system 10 can configure the preferred list directly from the desktop system, or, alternatively, the user can then send a command message (such as C) from the mobile device 24 to the desktop system 10 to activate the preferred list mode, or to add or delete certain senders or message characteristics from the preferred list that was previously configured. It should be appreciated that a redirection program could combine message characteristics and preferred sender lists to result in a more finely-tuned filter. Messages marked as low priority or that are simple return receipts or message read receipts, for example, could always be suppressed from redirection while messages from a particular sender would always be redirected.

After the redirector has determined that a particular message should be redirected, and it has prepared the message for redirection, the software 12 then sends the message A to a secondary memory store located in the mobile device 24, using whatever means are necessary. In the preferred embodiment this method is to send the message A back over the LAN 14, WAN 18, and through the wireless gateway 20 to the mobile data communication device 24. In doing so, the redirector preferably repackages message A as an E-mail with an outer envelope B that contains the addressing information of the mobile device 24, although alternative repackaging techniques and protocols could be used, such as a TCP/IP repackaging and delivery method (most commonly used in the alternative server configuration shown in FIG.2). The wireless gateway 20 requires this outer envelope information B in order to know where to send the redirected message A. Once the message (A in B) is received by the mobile device 24, the outer envelope B is removed and the original message A is placed in the secondary memory store within the mobile device 24. By repackaging and removing

the outer envelope in this manner, the present invention causes the mobile computer 24 to appear to be at the same physical location as the host system 10, thus creating a transparent system.

In the case where message C is representative of an external message from a computer on the Internet 18 to the host system 10, and the host 10 has been configured to redirect messages of type C, then in a similar manner to message A, message C would be repackaged with an outer envelope B and transmitted to the user's mobile device 24. In the case where message C is representative of a command message from the user's mobile device 24 to the host system 10, the command message C is not redirected, but is acted upon by the host system 10.

If the redirected user data item is an E-mail message, as described above, the user at the mobile device 24 sees the original subject, sender's address, destination address, carbon copy and blind carbon copy. When the user replies to this message, or when the user authors a new message, the software operating at the mobile device 24 adds a similar outer envelope to the reply message (or the new message) to cause the message to be routed first to the user's host system 10, which then removes the outer envelope and redirects the message to the final destination, such as back to computer 26. In the preferred embodiment, this results in the outgoing redirected message from the user's host system 10 being sent using the E-mail address of the host mailbox, rather than the address of the mobile device, so that it appears to the recipient of the message that the message originated from the user's desktop system 10 rather than the mobile data communication device. Any replies to the redirected message will then be sent to the desktop system 10, which if it is still in redirector mode, will repackage the reply and resend it to the user's mobile data device, as described above.

FIG. 2 is an alternative system diagram showing the redirection of user data items from a network server 11 to the user's mobile data communication device 24, where the redirector software 12 is operating at the server 11. This configuration is particularly advantageous for use with message

5 servers such as Microsoft's ® Exchange Server, which is normally operated so that all user messages are kept in one central location or mailbox store on the server instead of in a store within each user's desktop PC. This configuration has the additional advantage of allowing a single system administrator to configure and keep track of all users having messages redirected. If the system includes encryption keys, these too can be kept at one place for management and update purposes.

10 In this alternative configuration, server 11 preferably maintains a user profile for each user's desktop system 10, 26, 28, including information such as whether a particular user can have data items redirected, which types of message and information to redirect, what events will trigger redirection, the address of the users' mobile data communication device 24, the type of mobile device, and the user's preferred list, if any. The event triggers are preferably detected at the user's desktop system 10, 26, 28 and can be any of the external, internal or network events listed above. The desktop systems 10, 26, 28 preferably detect these events and then transmit a message to the server computer 11 via LAN 14 to initiate redirection. Although the user data items are preferably stored at the server computer 11 in this embodiment, they could, alternatively, be stored at each user's desktop system 10, 26, 28, which would then transmit them to the server computer 11 after an event has triggered redirection.

20 As shown in FIG. 2, desktop system 26 generates a message A that is transmitted to and stored at the host system 11, which is the network server operating the redirector program 12. The message A is for desktop system 10, but in this embodiment, user messages are stored at the network server 11. When an event occurs at desktop system 10, an event trigger is generated and transmitted to the network server 11, which then determines who the trigger is from, whether that desktop has redirection capabilities, and if so, the server (operating the redirector program) uses the stored

configuration information to redirect message A to the mobile computer 24 associated with the user of desktop system 10.

As described above with reference to FIG. 1, message C could be either a command message from a user's mobile data communication device 24, or it could be a message from an external computer, such as a computer connected to the Internet 18. If the message C is from an Internet computer to the user's desktop system 10, and the user has redirection capabilities, then the server 11 detects the message C, repackages it using electronic envelope B, and redirects the repackaged message (C in B) to the user's mobile device 24. If the message C is a command message from the user's mobile device 24, then the server 11 simply acts upon the command message.

Turning now to FIG. 3, a block diagram showing the interaction of the redirector software 12 with additional components of the host system 10 of FIG. 1 (the desktop PC) to enable more fully the pushing of information from the host system 10 to the user's mobile data communication device 24 is set forth. These additional components are illustrative of the type of event-generating systems that can be configured and used with the redirector software 12, and of the type of repackaging systems that can be used to interface with the mobile communication device 24 to make it appear transparent to the user.

The desktop system 10 is connected to LAN 14, and can send and receive data, messages, signals, event triggers, etc., to and from other systems connected to the LAN 14 and to external networks 18, 22, such as the Internet or a wireless data network, which are also coupled to the LAN 14. In addition to the standard hardware, operating system, and application programs associated with a typical microcomputer or workstation, the desktop system 10 includes the redirector program 12, a TCP/IP sub-system 42, an E-mail sub-system 44, a primary data storage device 40, a screen saver sub-system 48, and a keyboard sub-system 46. The TCP/IP and E-mail subsystems 42, 44 are

examples of repackaging systems that can be used to achieve the transparency of the present invention, and the screen saver and keyboard sub-systems 46, 48 are examples of event generating systems that can be configured to generate event messages or signals that trigger redirection of the user selected data items.

5           The method steps carried out by the redirector program 12 are described in more detail in FIG. 4. The basic functions of this program are: (1) configure and setup the user-defined event trigger points that will start redirection; (2) configure the types of user data items for redirection and optionally configure a preferred list of senders whose messages are to be redirected; (3) configure the type and capabilities of the user's mobile data communication device; (4) receive messages and signals from the repackaging systems and the event generating systems; and (5) command and control the redirection of the user-selected data items to the mobile data communication device via the repackaging systems. Other functions not specifically enumerated could also be integrated into this program.

10           The E-Mail sub-system 44 is the preferred link to repackaging the user-selected data items for transmission to the mobile data communication device 24, and preferably uses industry standard mail protocols, such as SMTP, POP, IMAP, MIME and RFC-822, to name but a few. The E-Mail sub-system 44 can receive messages A from external computers on the LAN 14, or can receive messages C from some external network such as the Internet 18 or a wireless data communication network 22, and stores these messages in the primary data store 40. Assuming that the redirector 12  
15           has been triggered to redirect messages of this type, the redirector detects the presence of any new messages and instructs the E-Mail system 44 to repackage the message by placing an outer wrapper B about the original message A (or C), and by providing the addressing information of the mobile data communication device 24 on the outer wrapper B. As noted above, this outer wrapper B is  
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removed by the mobile device 24, and the original message A (or C) is then recovered, thus making the mobile device 24 appear to be the desktop system 10.

In addition, the E-Mail sub-system 44 receives messages back from the mobile device 24 having an outer wrapper with the addressing information of the desktop system 10, and strips this information away so that the message can be routed to the proper sender of the original message A (or C). The E-Mail sub-system also receives command messages C from the mobile device 24 that are directed to the desktop system 10 to trigger redirection or to carry out some other function. The functionality of the E-Mail sub-system 44 is controlled by the redirector program 12.

The TCP/IP sub-system 42 is an alternative repackaging system. It includes all of the functionality of the E-Mail sub-system 44, but instead of repackaging the user-selected data items as standard E-mail messages, this system repackages the data items using special-purpose TCP/IP packaging techniques. This type of special-purpose sub-system is useful in situations where security and improved speed are important to the user. The provision of a special-purpose wrapper that can only be removed by special software on the mobile device 24 provides the added security, and the bypassing of E-mail store and forward systems can improve speed and real-time delivery.

As described previously, the present invention can be triggered to begin redirection upon detecting numerous external, internal and networked events, or trigger points. Examples of external events include: receiving a command message from the user's mobile data communication device 24 to begin redirection; receiving a similar message from some external computer; sensing that the user is no longer in the vicinity of the host system; or any other event that is external to the host system. Internal events could be a calendar alarm, screen saver activation, keyboard timeout, programmable timer, or any other user-defined event that is internal to the host system. Networked

events are user-defined messages that are transmitted to the host system from another computer that is connected to the host system via a network to initiate redirection.

The screen saver and keyboard sub-systems 46, 48 are examples of systems that are capable of generating internal events. Functionally, the redirector program 12 provides the user with the ability to configure the screen saver and keyboard systems so that under certain conditions an event trigger will be generated that can be detected by the redirector 12 to start the redirection process. For example, the screen saver system can be configured so that when the screen saver is activated, after, for example, 10 minutes of inactivity on the desktop system, an event trigger is transmitted to the redirector 12, which starts redirecting the previously selected user data items. In a similar manner the keyboard sub-system can be configured to generate event triggers when no key has been depressed for a particular period of time, thus indicating that redirection should commence. These are just two examples of the numerous application programs and hardware systems internal to the host system 10 that can be used to generate internal event triggers

FIGs. 4 and 5, set forth, respectively, flow charts showing the steps carried out by the redirector software 12 operating at the host system 10, and the steps carried out by the mobile data communication device 24 in order to interface with the host system. Turning first to FIG. 4, at step 50, the redirector program 12 is started and initially configured. The initial configuration of the redirector 12 includes: (1) defining the event triggers that the user has determined will trigger redirection; (2) selecting the user data items for redirection; (3) selecting the repackaging sub-system, either standard E-Mail, or special-purpose technique; (4) selecting the type of data communication device, indicating whether and what type of attachments the device is capable of receiving and processing, and inputting the address of the mobile device; and (5) configuring the preferred list of user selected senders whose messages are to be redirected.

FIG. 4 sets forth the basic steps of the redirector program 12 assuming it is operating at a desktop system 10, such as shown in FIG. 1. If the redirector 12 is operating at a network server 11, as shown in FIG. 2, then additional configuration steps may be necessary to enable redirection for a particular desktop system 10, 26, 28 connected to the server, including: (1) setting up a profile for the desktop system indicating its address, events that will trigger redirection, and the data items that are to be redirected upon detecting an event; (2) maintaining a storage area at the server for the data items; and (3) storing the type of data communication device to which the desktop system's data items are to be redirected, whether and what type of attachments the device is capable of receiving and processing, and the address of the mobile device.

Once the redirector program is configured 50, the trigger points (or event triggers) are enabled at step 52. The program 12 then waits 56 for messages and signals 54 to begin the redirection process. A message could be an E-Mail message or some other user data item that may have been selected for redirection, and a signal could be a trigger signal, or could be some other type of signal that has not been configured as an event trigger. When a message or signal is detected, the program determines 58 whether it is one of the trigger events that has been configured by the user to signal redirection. If so, then at step 60 a trigger flag is set, indicating that subsequently received user data items (in the form of messages) that have been selected for redirection should be pushed to the user's mobile data communication device 24.

If the message or signal 54 is not a trigger event, the program then determines at steps 62, 68 and 66 whether the message is, respectively, a system alarm 62, an E-Mail message 64, or some other type of information that has been selected for redirection. If the message or signal is none of these three items, then control returns to step 56, where the redirector waits for additional messages 54 to act upon. If, however the message is one of these three types of information, then the program



12 determines, at step 68, whether the trigger flag has been set, indicating that the user wants these items redirected to the mobile device. If the trigger flag is set, then at step 70, the redirector 12 causes the repackaging system (E-Mail or TCP/IP) to add the outer envelope to the user data item, and at step 72 the repackaged data item is then redirected to the user's mobile data communication device 24 via LAN 14, WAN 18, wireless gateway 20 and wireless network 22. Control then returns to step 56 where the program waits for additional messages and signals to act upon. Although not shown explicitly in FIG. 4, after step 68, the program could, if operating in the preferred list mode, determine whether the sender of a particular data item is on the preferred list, and if not, then the program would skip over steps 70 and 72 and proceed directly back to step 56. If the sender was on the preferred list, then control would similarly pass to steps 70 and 72 for repackaging and transmission of the message from the preferred list sender.

FIG. 5 sets forth the method steps carried out by the user's mobile data communication device 24 in order to interface to the redirector program 12 of the present invention. At step 80 the mobile software is started and the mobile device 24 is configured to operate with the system of the present invention, including, for example, storing the address of the user's desktop system 10.

At step 82, the mobile device waits for messages and signals 84 to be generated or received. Assuming that the redirector software 12 operating at the user's desktop system 10 is configured to redirect upon receiving a message from the user's mobile device 24, at step 86, the user can decide to generate a command message that will start redirection. If the user does so, then at step 88 the redirection message is composed and sent to the desktop system 10 via the wireless network 22, through the wireless gateway 20, via the Internet 18 to the LAN 14, and is finally routed to the desktop machine 10. In this situation where the mobile device 24 is sending a message directly to the desktop system 10, no outer wrapper is added to the message (such as message C in FIGs. 1 and 2).

In addition to the redirection signal, the mobile device 24 could transmit any number of other commands to control the operation of the host system, and in particular the redirector program 12. For example, the mobile 24 could transmit a command to put the host system into the preferred list mode, and then could transmit additional commands to add or subtract certain senders from the preferred list. In this manner, the mobile device 24 can dynamically limit the amount of information being redirected to it by minimizing the number of senders on the preferred list. Other example commands include: (1) a message to change the configuration of the host system to enable the mobile device 24 to receive and process certain attachments; and (2) a message to instruct the host system to redirect an entire data item to the mobile device in the situation where only a portion of a particular data item has been redirected.

Turning back to FIG. 5, if the user signal or message is not a direct message to the desktop system 10 to begin redirection (or some other command), then control is passed to step 90, which determines if a message has been received. If a message is received by the mobile, and it is a message from the user's desktop 10, as determined at step 92, then at step 94 a desktop redirection flag is set "on" for this message, and control passes to step 96 where the outer envelope is removed. Following step 96, or in the situation where the message is not from the user's desktop, as determined at step 92, control passes to step 98, which displays the message for the user on the mobile device's display. The mobile unit 24 then returns to step 82 and waits for additional messages or signals.

If the mobile device 24 determines that a message has not been received at step 90, then control passes to step 100, where the mobile determines whether there is a message to send. If not, then the mobile unit returns to step 82 and waits for additional messages or signals. If there is at least one message to send, then at step 102 the mobile determines whether it is a reply message to a message that was received by the mobile unit. If the message to send is a reply message, then at step

108, the mobile determines whether the desktop redirection flag is on for this message. If the redirection flag is not on, then at step 106 the reply message is simply transmitted from the mobile device to the destination address via the wireless network 22. If, however, the redirection flag is on, then at step 110 the reply message is repackaged with the outer envelope having the addressing information of the user's desktop system 10, and the repackaged message is then transmitted to the desktop system 10 at step 106. As described above, the redirector program 12 executing at the desktop system then strips the outer envelope and routes the reply message to the appropriate destination address using the address of the desktop system as the "from" field, so that to the recipient of the redirected message, it appears as though it originated from the user's desktop system rather than the mobile data communication device.

If, at step 102, the mobile determines that the message is not a reply message, but an original message, then control passes to step 104, where the mobile determines if the user is using the redirector software 12 at the desktop system 10, by checking the mobile unit's configuration. If the user is not using the redirector software 12, then the message is simply transmitted to the destination address at step 106. If, however, the mobile determines that the user is using the redirector software 12 at the desktop system 10, then control passes to step 110, where the outer envelope is added to the message. The repackaged original message is then transmitted to the desktop system 10 at step 106, which, as described previously, strips the outer envelope and routes the message to the correct destination. Following transmission of the message at step 106, control of the mobile returns to step 82 and waits for additional messages or signals.

Having described in detail the preferred embodiments of the present invention, including the preferred methods of operation, it is to be understood that this operation could be carried out with

different elements and steps. This preferred embodiment is presented only by way of example and is not meant to limit the scope of the present invention which is defined by the following claims.

100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800 801 802 803 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819 820 821 822 823 824 825 826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843 844 845 846 847 848 849 850 851 852 853 854 855 856 857 858 859 860 861 862 863 864 865 866 867 868 869 870 871 872 873 874 875 876 877 878 879 880 881 882 883 884 885 886 887 888 889 890 891 892 893 894 895 896 897 898 899 900 901 902 903 904 905 906 907 908 909 910 911 912 913 914 915 916 917 918 919 920 921 922 923 924 925 926 927 928 929 930 931 932 933 934 935 936 937 938 939 940 941 942 943 944 945 946 947 948 949 950 951 952 953 954 955 956 957 958 959 960 961 962 963 964 965 966 967 968 969 970 971 972 973 974 975 976 977 978 979 980 981 982 983 984 985 986 987 988 989 990 991 992 993 994 995 996 997 998 999 1000

**What is claimed:**

1. A method of pushing data items from a host system to a mobile data communication device comprising the steps of:

5 detecting an event trigger at the host system; and

in response to detecting the event, continuously redirecting the data items from the host system to the mobile data communication device.

2. The method of claim 1, further comprising the step of:

10 selecting at least one type of data item to redirect from the host system to the mobile data communication device.

3. The method of claim 1, further comprising the step of:

15 selecting particular event triggers that will cause the host system to begin redirecting the data items.

4. The method of claim 1, further comprising the step of:

providing information regarding the configuration of the mobile data communication device.

20 5. The method of claim 4, wherein the configuration information includes:

the address of the mobile data communication device.

6. The method of claim 4, wherein the configuration information includes:

the type of mobile data communication device.

7. The method of claim 4, wherein the configuration information includes:

the types of data item attachments that the mobile data communication device can receive and  
5 process.

8. The method of claim 5, further comprising the step of:

repackaging the data items prior to redirection to the mobile data communication device by  
placing the data items in an electronic wrapper addressed using the address information of the mobile  
10 data communication device.

9. The method of claim 7, further comprising the steps of:

for each data item to be redirected, determining whether the data item includes an attachment,  
and determining the type of attachment;

15 determining whether the mobile data communication device can receive and process such  
attachments; and

if so, then redirecting the attachments to the mobile data communication device, and if not,  
then redirecting the attachments to an external machine that is compatible with the attachment.

20 10. The method of claim 9, wherein the type of attachment is a sound file.

11. The method of claim 3, wherein the event triggers include external events, internal events,  
or networked events.

12. The method of claim 11, wherein the external event is a message from the mobile data communication device to start redirection.

13 The method of claim 11, wherein the internal event is a calendar alarm.

5

14. The method of claim 11, wherein the internal event is a screen saver activation.

15. The method of claim 11, wherein the internal event is a keyboard timeout signal.

10

16. The method of claim 11, wherein the networked events include messages to begin redirection from computer systems connected to the host system via a network.

15

17. The method of claim 8, further including the steps of:  
receiving the repackaged data items at the mobile data communication device; and  
removing the electronic wrapper from the data items and storing them at the mobile device.

18. The method of claim 15, further including the steps of:  
providing the address of the host system to the mobile data communication device;  
generating a reply data item at the mobile data communication device in response to a data  
item received from the host system; and

20

repackaging the reply data item by placing it in an electronic wrapper addressed using the address information of the host system.

19. The method of claim 1, wherein the mobile data communication device is a pager.

20. The method of claim 1, wherein the mobile data communication device is a device equipped to receive both voice and non-voice data messages.

5

21. The method of claim 1, wherein the host system includes a preferred list for limiting the redirection step to redirecting only those data items that are transmitted to the host system from a sender on the preferred list.

10

22. The method of claim 21, wherein a user can add and subtract senders from the preferred list.

23. The method of claim 21, wherein the preferred list is activated and deactivated at the host system.

15

24. The method of claim 21, wherein the preferred list is activated and deactivated by a command message transmitted from the mobile data communication device to the host system.

25. The method of claim 22, wherein the user can add and subtract senders from the preferred list by configuring the host system.

20

26. The method of claim 22, wherein the user can add and subtract senders from the preferred list by transmitting a command message from the mobile data communication device to the host system.



27. A method of replicating data between a first system and a second system comprising:

establishing a first set of data elements at the first system as subject to replication with a corresponding set of data elements at the second system;

detecting an event trigger has occurred at the first system;

5 providing an indication of the data element in the first set of data that has changed to the second system by placing information in an electronic wrapper delivered to the second system as part of a data transfer transaction;

initiating the data transfer transaction thereby transferring the electronic wrapper to the second system;

10 receiving the electronic wrapper at the second system;

processing the electronic wrapper; and

updating each element in the corresponding set of data elements that requires updating as a result of the change in the data element in the first set of data elements.

15 28. The method of claim 27, wherein the first system is a host computer and the second system is a hand held electronic device.

29. The method of claim 27, wherein the first system is a hand held electronic device and the second system is a host computer.

20 30. The method of claim 27, wherein the data transaction is an electronic message sent from the first system through a data network to the second system.

31. The method of claim 27, wherein the first set of data elements is a set of calendar entries.

32. The method of claim 27, wherein the first set of data elements is a set of address book entries.

33. The method of claim 30, wherein the electronic wrapper includes an attachment to the electronic message.

34. The method of claim 30, wherein the electronic message is an e-mail message and the data network is the Internet.

35. The method of claim 27, wherein the method includes a step of receiving from the second system a request to begin replication.

36. The method of claim 35, wherein the method includes a step of processing the request to begin replication.

37. The method of claim 27, wherein the second system can limit the information being sent to it by sending a command to the first system.

38. A method of remotely controlling a host system from a personal communications device comprising the steps of:

establishing at the host system a set of commands that can be invoked to require the host system to act in response to invocation of any such command;

5 sending from the personal communications device a direction to the host system to invoke a command from the set of commands;

invoking the command at the host system; and

processing the command so that the host responds to the command.

5

39 The method of claim 38, wherein at least one command is a direction to continuously redirect certain data elements from the host system to the personal communications system.

10 40. The method of claim 38, wherein the host system provides an indication that data has been redirected.

41. The method of claim 38, wherein the data elements that have been redirected are marked at the host system as redirected.

15 42. The method of claim 38 comprising the further step of transmitting from the personal communications device to host device an acknowledgment that the personal communications device is receiving data redirected from the host system.

20 43. The method of claim 38, wherein the personal communication device can limit the information being sent to it by transmitting a command to the host device.

44. A system for pushing information from a host system to a mobile data communication device, comprising:

a communications network over which the host system and the mobile data communications device can communicate;

a redirector program comprising:

software instruction means for prompting a user to select certain data items of information to be pushed to the mobile device;

software instruction means for defining one or more events that will trigger the system to begin pushing the selected information; and

software instruction means for detecting the occurrence of the one or more events and for pushing the selected data items of information from the host system to the mobile data communication device via the network; and

a software program operating at the mobile data communications device for receiving the data items of information from the host system.

45. The system of claim 44, wherein the redirector program is operating at the host system.

46. The system of claim 44, further comprising:

a network server in communication with the host system, and wherein the redirector program is operating at the network server.

47. The system of claim 44, further comprising a preferred list stored at the host system for limiting the pushing of selected data items to those items that were sent to the host system from a sender on the preferred list.

48. The system of claim 47, further comprising means for adding and subtracting senders from the preferred list.

49. The system of claim 47, wherein the preferred list is activated and deactivated by a command message transmitted to the host system from the mobile data communication device.

50. The system of claim 48, wherein the means for adding and subtracting comprises a command message transmitted to the host system from the mobile data communication device.

## ABSTRACT OF THE DISCLOSURE

A system and method for pushing information from a host system to a mobile data communication device upon sensing a triggering event is disclosed. A redirector program operating at the host system enables a user to continuously redirect certain user-selected data items from the host system to the user's mobile data communication device upon detecting that one or more user-defined triggering events has occurred. The redirector program operates in connection with event generating applications and repackaging systems at the host system to configure and detect a particular user-defined event, and then to repackage the user-selected data items in an electronic wrapper prior to pushing the data items to the mobile device.



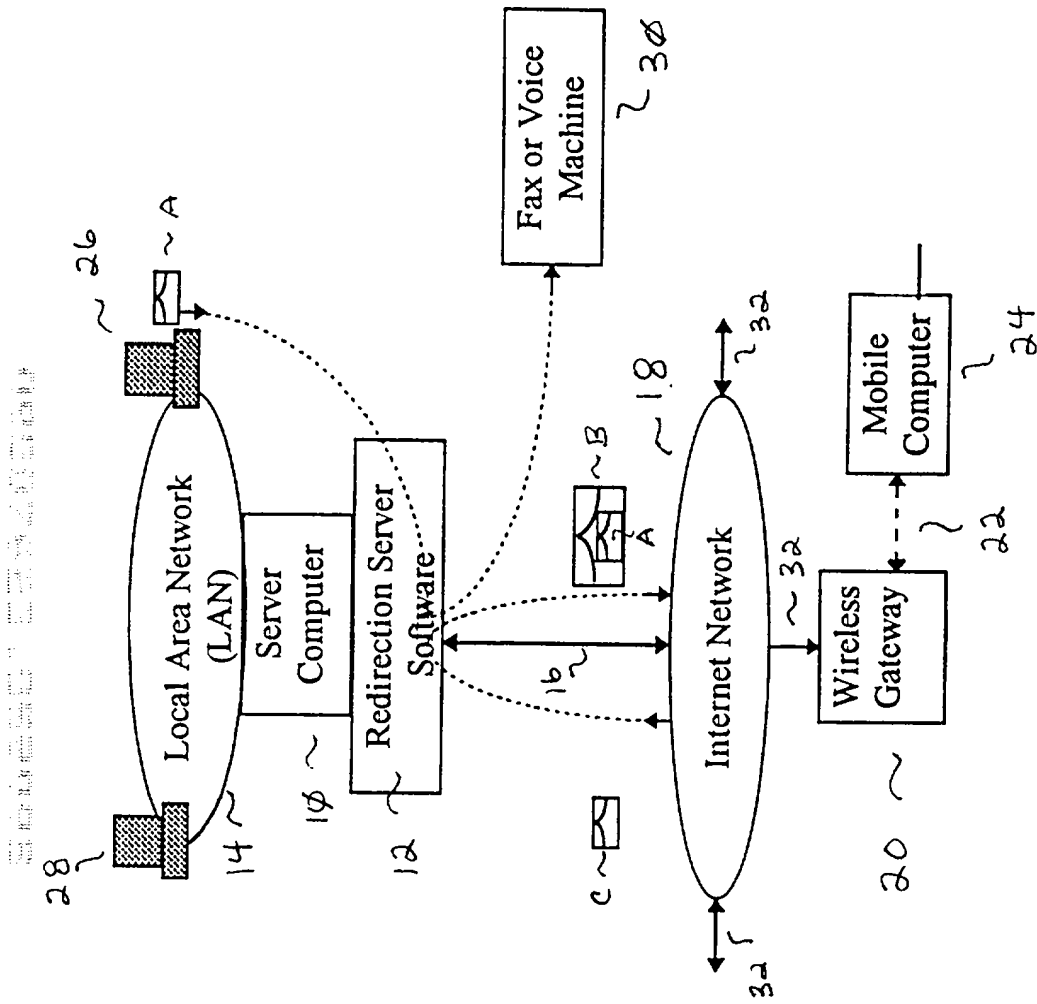


FIG. 2



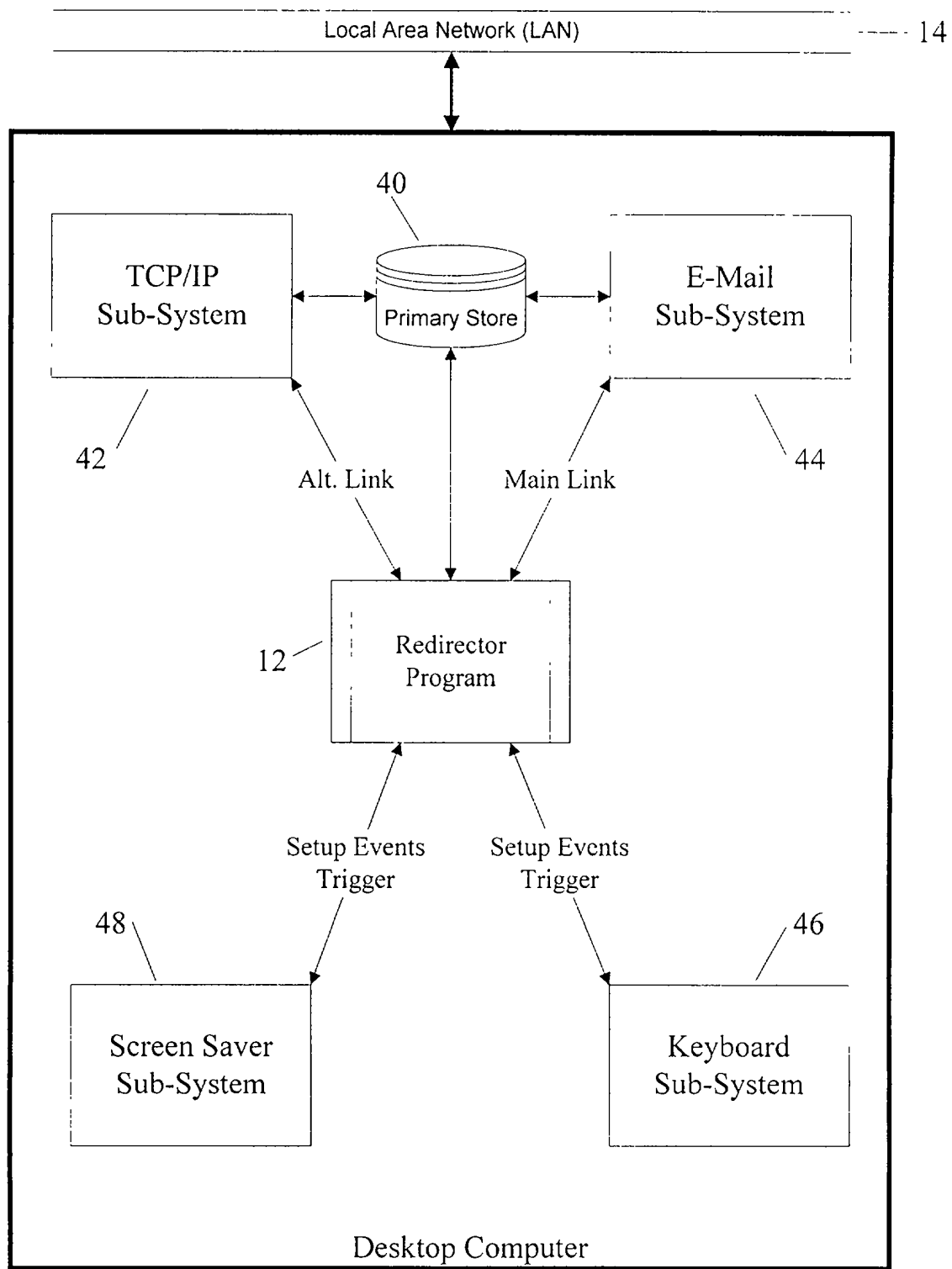


FIG. 3

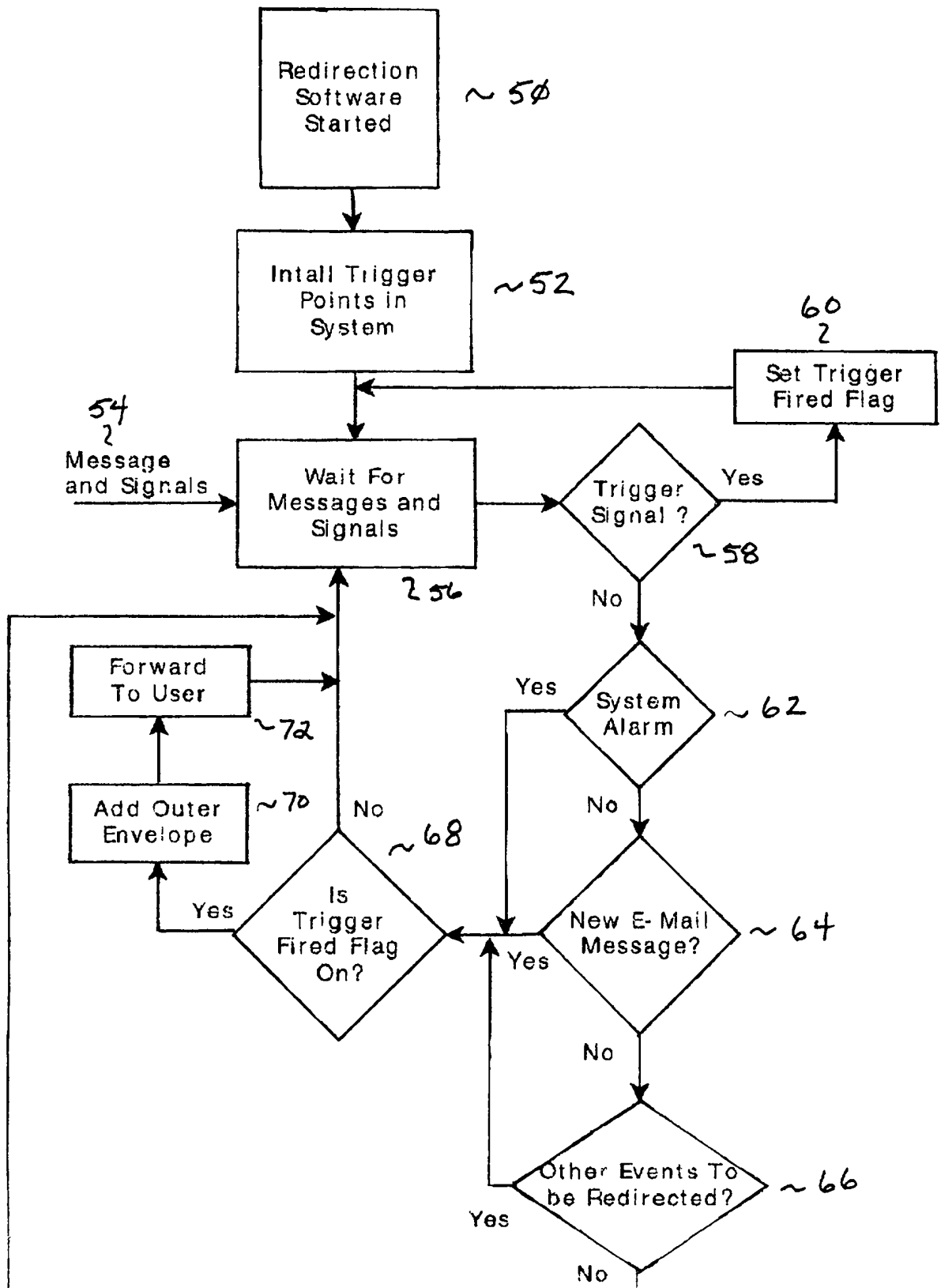


FIG. 4

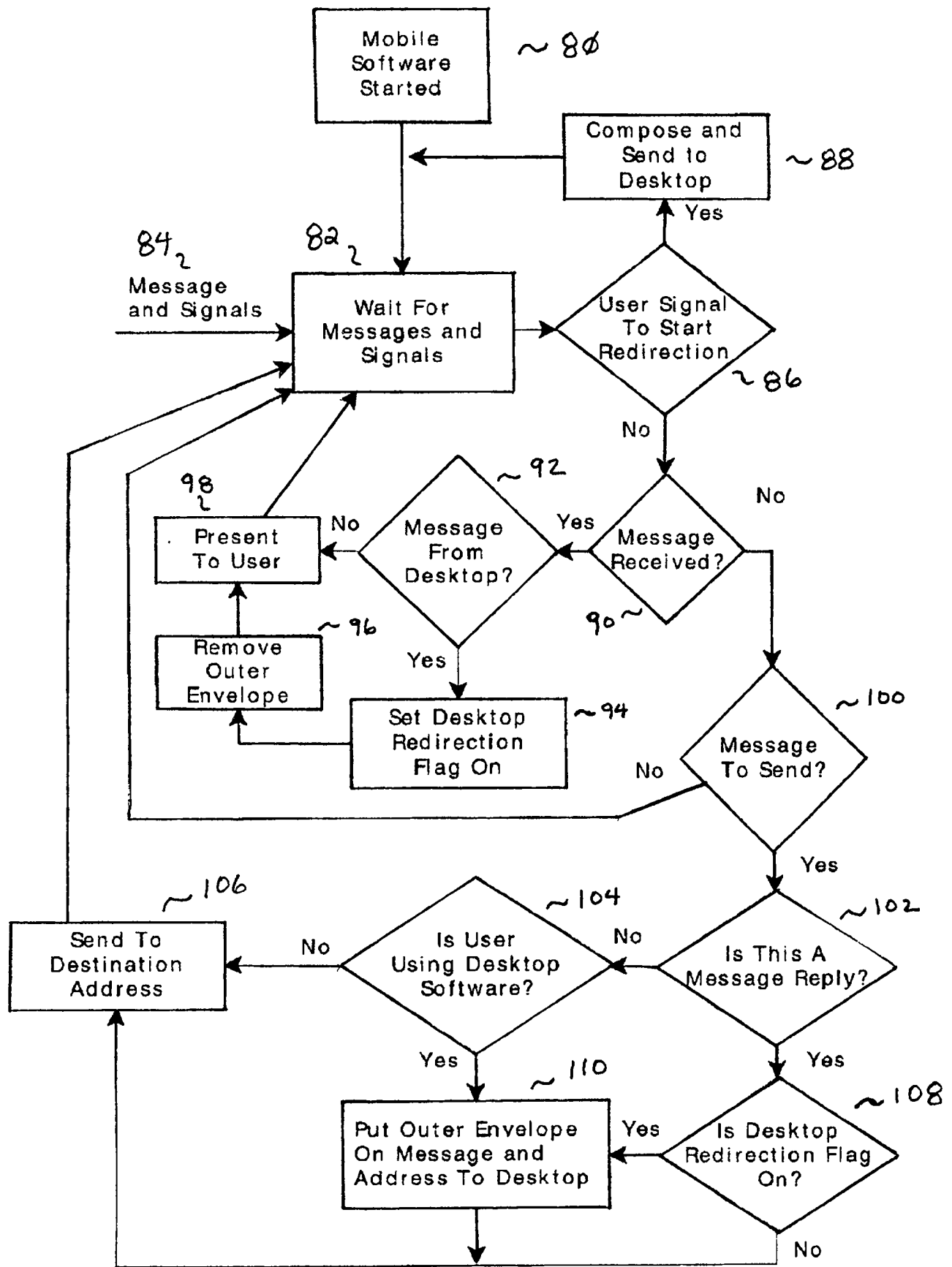


FIG. 5

**DECLARATION AND POWER OF ATTORNEY**  
(Joint Inventors - Foreign)

We, Mihal Lazaridis and Gary P. Mousseau hereby declare that we are, respectively,  
a citizen of Canada, residing at 272 Northerest Place, Waterloo, Ontario, CANADA N2J 3X5;  
a citizen of Canada, residing at 523B Rosemeadow Crescent, Waterloo, Ontario, CANADA  
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that we have reviewed and understand the content of the specification, including the claims, (Jones,  
Day, Reavis & Pogue Docket No. 555255012073).

attached hereto;

and we believe that we are the original, first, and joint inventors of the subject matter which is  
claimed therein and for which a patent is sought on the invention or discovery entitled

SYSTEM AND METHOD FOR PUSHING INFORMATION FROM A HOST  
SYSTEM TO A MOBILE DATA COMMUNICATION DEVICE

and that we acknowledge our duty to disclose information of which we are aware which is material  
to the examination of this application, in accordance with Title 37, Code of Federal Regulations,  
Section 1.56(a).

We hereby designate the following as our mailing address and telephone number:

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and appoint each of the following as our attorneys with full power of substitution and revocation,  
to prosecute this application and to transact all business in the Patent and Trademark Office  
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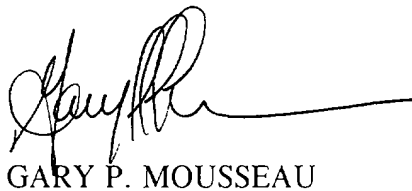
We further declare that all statements made herein of our own knowledge are true and that  
all statements made on information and belief are believed to be true; and further that these  
statements were made with the knowledge that willful false statements and the like so made are  
punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States  
Code, and that such willful false statements may jeopardize the validity of the application or any  
patent issuing thereon.



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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Research In Motion Limited

Serial No.: Not Yet Assigned

Filed: Herewith

Title: SYSTEM AND METHOD FOR PUSHING INFORMATION FROM A  
HOST SYSTEM TO A MOBILE DATA COMMUNICATION DEVICE

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By Deborah A. Satoran

Assistant Commissioner for Patents  
Washington, D. C. 20231

**VERIFIED STATEMENT CLAIMING SMALL ENTITY STATUS**

Sir:

I hereby declare that I am an officer of the concern identified below and am empowered to act on its behalf.

The concern qualifies as a small business concern as defined in 37 C.F.R. § 1.9 for purposes of paying reduced fees, in that the number of employees thereof, including those of its affiliates, does not exceed 500 persons.

The exclusive rights to the invention described and claimed in the above-identified application have been conveyed to and remain with the concern, or if the rights are not exclusive, all other rights belong to small entities as defined in 37 C.F.R. § 1.9.

I acknowledge the duty to file, in this application, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the

earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

RESEARCH IN MOTION LIMITED

By:   
Charles B. Meyer  
Vice President, Corporate Secretary

Date: 5/28/98 -